LIGHTNIN

MIXER MANUAL

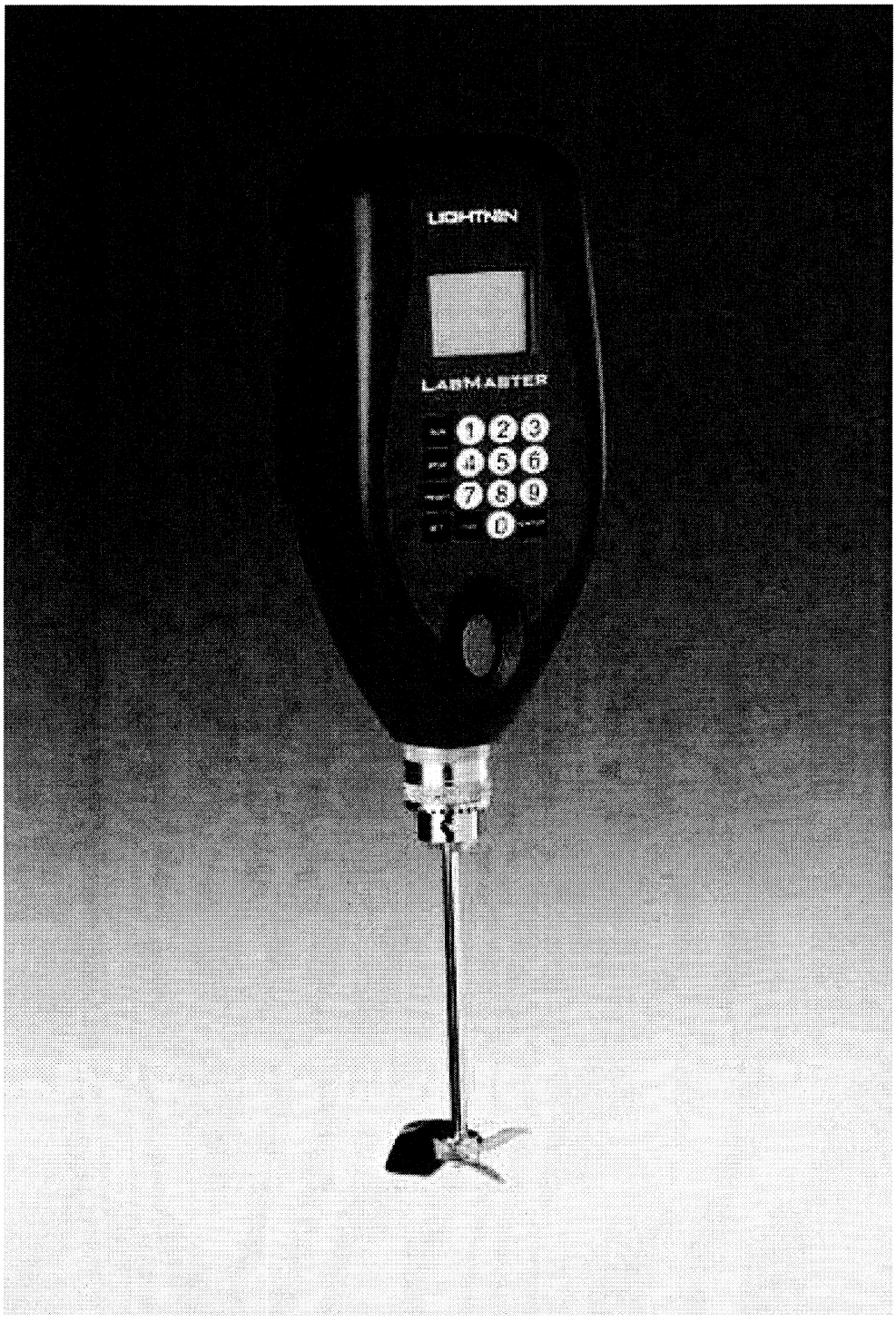
INSTRUCTIONS

INSTALLATION

OPERATION

MAINTENANCE

LIGHTNIN®



LabMaster™ Mixer
Operational Guide
BK223116 Rev.E

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⚠ WARNING NOTES

- DO NOT START MIXER BEFORE VERIFYING VOLTAGE CONFIGURATION.
- THE LabMaster MIXER IS SUPPLIED CONFIGURED FOR THE DESTINATION LINE VOLTAGE REQUESTED (115 **OR** 230 VOLTS). CHECK WHETHER THE VOLTAGE INDICATED ON THE REAR OF THE UNIT MATCHES THE AVAILABLE LINE VOLTAGE.
- DO NOT ATTEMPT TO SERVICE OR REPOSITION THE MIXER WHILE SHAFT/IMPELLER IS ROTATING.
- DO NOT ALLOW LOOSE CLOTHING OR PARTS OF THE BODY TO COME NEAR THE ROTATING MIXER SHAFT.
- BEFORE SERVICING THE MIXER, ALWAYS TURN THE POWER OFF USING THE ON/OFF SWITCH ON THE FRONT OF THE UNIT. UNPLUG AND REMOVE THE POWER CORD TO AVOID TANGLING OR BREAKING.
- DO NOT ATTEMPT TO OPEN OR REPAIR THE MIXER. THERE IS NO USER SERVICEABLE COMPONENTS IN THE MIXER. REMOVAL OR DESTRUCTION OF THE HOUSING VOIDS ANY WARRANTY, EXPLICIT OR IMPLIED. CONSULT THE FACTORY FOR QUALIFIED TECHNICAL SERVICE ASSISTANCE.
- USE ONLY HIGH QUALITY *LIGHTNIN* MIXER SHAFTS AND HEAVY-DUTY RING STANDS. USE OF NON-LIGHTNIN MIXER SHAFTS OR RING STAND COULD RESULT IN INJURY TO THE OPERATOR OR DAMAGE TO THE LabMaster MIXER.
- ALWAYS KEEP THE LabMaster MIXER SHAFT CLEAN. ACCUMULATION OF FOREIGN MATTER ON THE SHAFT COULD INCREASE THE POTENTIAL FOR PERSONAL INJURY.
- CARE MUST BE TAKEN WHEN SETTING THE OPERATING SPEEDS OF YOUR MIXER. OPERATION AT EXCESSIVE SPEEDS IN SMALL MIXING VESSELS COULD CAUSE CONTENTS TO SPLASH ON PERSONNEL IN THE AREA.
- AT CERTAIN SPEEDS, THE MIXER SHAFT MAY EXPERIENCE EXCESSIVE VIBRATION. THIS IS DUE TO NATURAL FREQUENCY OSCILLATIONS. OPERATING IN THIS MODE IS DANGEROUS. ALTER THE SPEED HIGHER OR LOWER TO ELIMINATE THE VIBRATION.

⚠ AVERTISSEMENT

- VERIFIER LA TENSION DU COURANT AVANT DE METTRE L'AGITATEUR EN MARCHE.
- LE SELECTEUR DE TENSION DU LabMaster A ETE POSITIONNE EN USINE POUR LA TENSION DU PAYS DESTINATAIRE DEMANDEE (115 **OU** 230 V). VERIFIER SI LA TENSION INDIQUEE, A L'ARRIERE DE L'APPAREIL, CORRESPOND BIEN A LA TENSION LOCALE DU SECTEUR.
- NE PAS DEPLACER L'AGITATEUR LORSQUE L'ARBRE PORTE HELICE TOURNE.
- EVITER TOUT CONTACT AVEC LES PARTIES TOURNANTES.
- AVANT TOUTE INTERVENTION SUR L'AGITATEUR, METTRE L'INTERRUPTEUR MARCHE-ARRET, SITUE EN FACADE DE L'APPAREIL, EN POSITION ARRET. DEBRANCHER ET RETIRER LE CORDON D'ALIMENTATION POUR EVITER DE L'EMMELER OU DE LE CASSER..
- EN CAS DE PANNE, NOUS CONSULTER. NE PAS ESSAYER D'OUVRIR OU DE REPARER L'AGITATEUR SOI MEME. L'ENTRETIEN DES COMPOSANTS INTERNES DEMANDE UN PERSONNEL ET UN OUTILLAGE SPECIALISES. TOUTE INTERVENTION PAR UNE PERSONNE NON HABILITEE ANNULERAIT LAGARANTIE.
- N'UTILISER QUE DES ACCESSOIRES FOURNIS PAR *LIGHTNIN.* L'UTILISATION D'ARBRES ET DE SUPPORTS D'AUTRE PROVENANCE PEUT ETRE. LA CAUSE D'ACCIDENTS CORPORELS OU MATERIELS.
- NETTOYER REGULIEREMENT L'ARBRE PORTE HELICE L'ACCUMULATION DE PRODUIT SUR L'ARBRE PEUT ETRE LA CAUSE D'ACCIDENTS CORPORELS OU MATERIELS.
- NE PAS FAIRE TOURNER L'AGITATEUR A DES VITESSES EXCESSIVES DANS DE PETITS VOLUMES AFIN D'EVITER DES PROJECTIONS DE PRODUIT.
- A CERTAINES VITESSES, L'AGITATEUR PEUT SUBIR DES VIBRATIONS EXCESSIVES. CELLES-CI SONT DUES AUX FREQUENCES NATURELLES D'OSCILLATION (LES HARMONIQUES). L'UTILISATION DE L'AGITATEUR A CES FREQUENCES EST DANGEREUX ET DOMMAGEABLE. POUR ELIMINER CES VIBRATIONS, IL FAUT AUGMENTER OU REDUIRE LA VITESSE

⚠ WARNUNGSHINWEISE:

- DEN LabMaster NICHT ANSTELLEN BEVOR DIE SPANNUNGSEINSTELLUNG (Voltzah) ÜBERPRÜFT WURDE.
- DER LabMaster WURDE FÜR DEN BETRIEB MIT DER VOM KUNDEN GEWÜNSCHTEN NETZSPANNUNG GELIEFERT (115 ODER 230 V). BITTE PRÜFEN SIE, OB DIE AUF DER RÜCKSEITE DER ANTRIEBSEINHEIT ANGEGEBENE SPANNUNG MIT DER VERFÜGBAREN NETZSPANNUNG ÜBEREINSTIMMT.
- NICHT VERSUCHEN, DEN LabMaster ZU WARTEN ODER UMZUSTELLEN, WÄHREND SICH DIE WELLE/RÜHRORGAN DREHEN.
- LOCKERE KLEIDUNGSSTÜCKE ODER KÖRPERTEILE VON DER ROTIERENDEN WELLE UNBEDINGT FERNHALTEN.
- BEVOR SIE SERVICEARBEITEN AM RÜHRER VORNEHMEN SCHALTEN SIE GRUNDS TZLICH DEN RÜHRER MITTELS EIN-/AUSSCHALTER AN DER VORDESEITE AUS UND ZIEHEN SIE DAS NETZKABEL, UM EINE EVENTUELLE VERWICKLUNG ODER KABELBRUCH ZU VERMEIDEN.
- NICHT VERSUCHEN, DEN LabMaster ZU ÖFFNEN ODER ZU REPARIEREN. ES GIBT KEINE AUSWECHSELBAREN BESTANDTEILE IM LabMaster. DAS BESEITIGEN ODER DIE ZERSTÖRUNG VON GEHÄUSEDICHTUNGEN HEBEN JEGLICHE GARANTIEN AUF, EGAL OB DIESE DEUTLICH ODER INBEGRIFFEN SIND. FRAGEN SIE BEIM HERSTELLER NACH QUALIFIZIERTER TECHNISCHER SERVICEUNTERSTUTZUNG.
- NUR HOCHQUALIFIZIERTE RÜHRERWELLEN UND STABILE RINGSTATIVE VON *LIGHTNIN* BENUTZEN. DER GEBRAUCH VON RÜHRERWELLEN UND RINGSTATIVE EINER ANDEREN MARKE KÖNNEN ZU VERLETZUNGEN DES BEDIENERS ODER ZU SCHÄDEN AN DEM LabMaster SI MIXER FÜHREN.
- DIE LabMaster RÜHRERWELLE IMMER SAUBER HALTEN. SCHMUTZANHÄUFUNGEN AUF DER WELLE KÖNNEN DIE VERLETZUNGSGEFAHR DES BEDIENUNGSPERSONALS ERHÖHEN.
- DIE GESCHWINDIGKEITEN DES LabMasters MÜSSEN VORSICHTIG EINGESTELLT WERDEN. BEI MISCHUNGEN MIT HOHEN GESCHWINDIGKEITEN IN KLEINEN MISCHBEHÄLTERN KÖNNEN FLÜSSIGKEITEN AUF PERSONAL IN UNMITTELBARER NÄHE GESPRITZT WERDEN.
- BEI BESTIMMTEN DREHZAHLEN KÖNNEN AN DER RÜHRERWELLE GRÖßERE SCHWINGUNGEN, AUFGRUND DER EIGENSCHWINGUNGSZAHI DES RÜHRWERKES, AUFTRETEN. EIN BETRIEB IN DIESEM BEREICH IST BEDENKLICH UND ES SOLLTEN DREHZAHLEN ÜBER ODER UNTER DIESEM BEREICH GEWÄHLT WERDEN, UM DIESE SCHWINGUNGEN ZU VERMEIDEN.

1 Regulatory Notices

This equipment is designed to be safe at least under the following conditions: Indoor use, altitude up to 2000m, temperature 5°C to 40°C, maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40%, mains supply voltage fluctuations not to exceed +/-10% of the nominal voltage, transient overvoltages according to Installation Category 11 and Pollution degree 2 in accordance with IEC 664.

FCC Notice (U.S. Only)

All models of Lightnin Labmaster series mixers are classified by the FCC as Class A digital devices and as such the following FCC notices apply:

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

IC Notice (Canada Only)

All models of Lightnin Labmaster series mixer are classified by Industry Canada (IC) ICES-003, Issue 2 as Class A digital devices. Devices that are tested and comply with Class A FCC Specifications also comply with the Canadian Specification following the harmonization of Canadian Regulation with existing FCC regulations effective January 31, 1989. As such the following notices apply:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere Des Communications du Canada.

CE Notice

Marking by the CE symbol indicates compliance of all models of the *LIGHTNIN* Labmaster series mixers to the Machinery Directive, Low Voltage Directive and EMC Directive of the European Community. The *LIGHTNIN* LabMaster mixers meet technical standard EN55022 - Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment (ITE) as a Class A device. As such the following notices apply:

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI Notice (Japan Only)

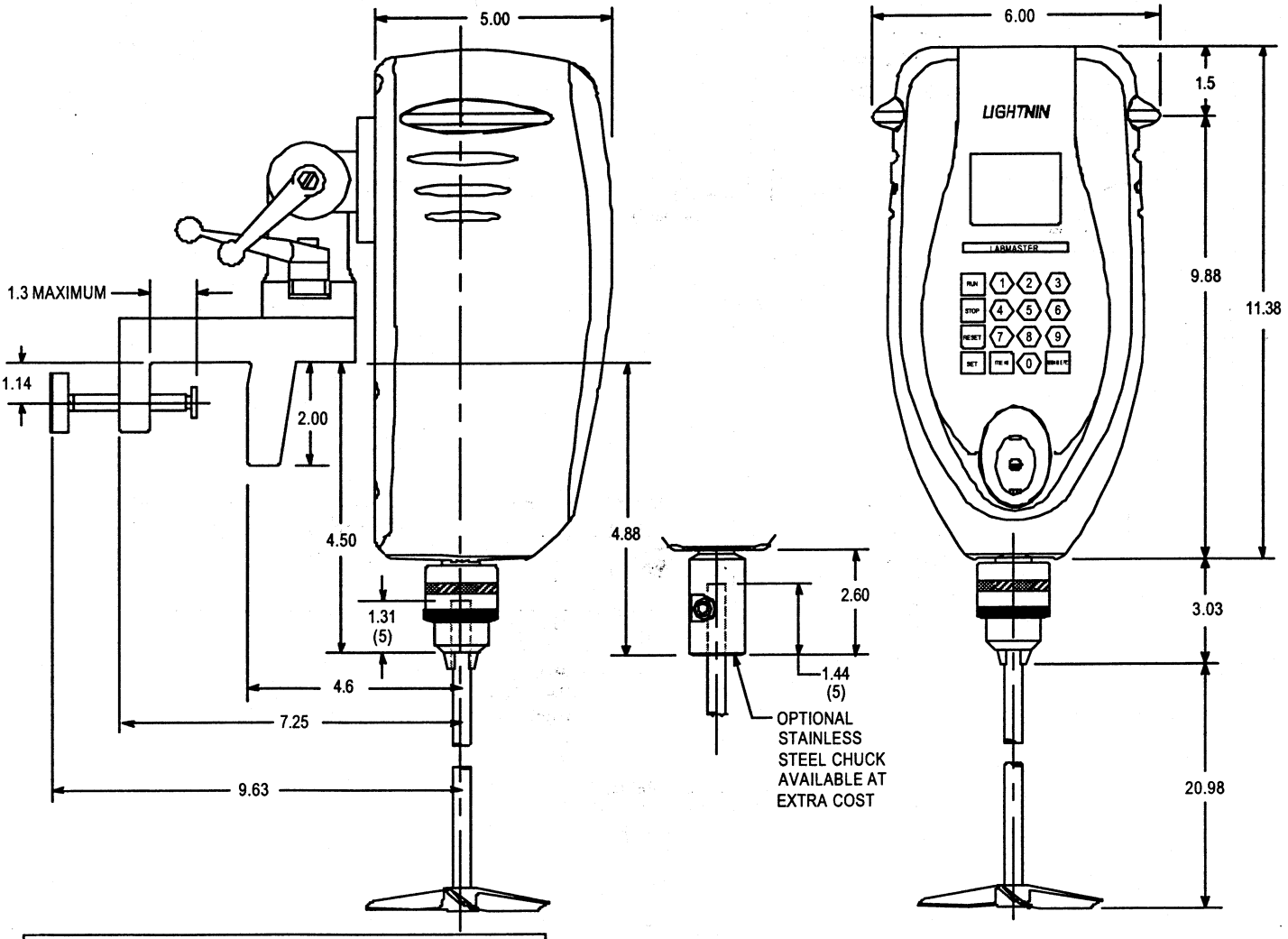
All models of *LIGHTNIN* Labmaster series mixers are classified by the Voluntary Control Council for Interference (VCCI) as Class 1 information technology equipment (ITE) and as such the following VCCI notices apply:

Class 1 Notice

This equipment complies with the limits for a Class 1 digital device (devices used in commercial and/or industrial environments) and conforms to the standards for information technology equipment (ITE) that are set by the Voluntary Control Council for Interference for preventing radio frequency interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an area adjacent to a residential area, this equipment may cause radio interference with radio and television receivers or other communications equipment.

To ensure that such radio interference does not occur, it is important to install and use this equipment in accordance with the manufacturer's instruction manual.



LabMaster IMPELLERS INCLUDED				
MODEL	A310 DIA. (IN.)	A100 DIA. (IN.)	R100 DIA. (IN.)	A320 DIA. (IN.)
L1U10	4.00	2.72	2.00	---
L5U10	--	3.12	2.00	5.00

MODEL	H.P.	WATTS	SPEED REDUCTION	OUTPUT R.P.M.
L1U10	1/8	90	1:1	50 - 1800
L5U10	1/8	90	3.66:1	20 - 550

NOTES:
(1) TOTAL MIXER WEIGHT: 18 LBS. OPTIONAL RING STAND WEIGHT: 14 LBS.
(2) POWER CORD WITH GROUNDED PLUG. LENGTH APPROX. 6 FEET
(3) ALL DIMENSIONS ARE IN INCHES.
(4) THE SHAFT LENGTH OF THE L1U10 MODEL CAN BE ADJUSTED BY PASSING THE SHAFT THROUGH THE UNIT.
(5) MODEL L5U10 ONLY

CE COMPLIANT

ALL EQUIPMENT DESIGN AND APPLICATION DATA SHOWN HEREIN AND RELATED KNOW-HOW IS CONFIDENTIAL AND THE PROPERTY OF THE LIGHTNIN GROUP OF COMPANIES.
NO USE OR DISCLOSURE THEREOF MAY BE MADE WITHOUT OUR WRITTEN PERMISSION.

LIGHTNIN®
MIXERS AND AERATORS

ISO 9001 CERTIFIED

CERTIFIED BY: DATE:

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DIMENSION DRAWING

LabMaster

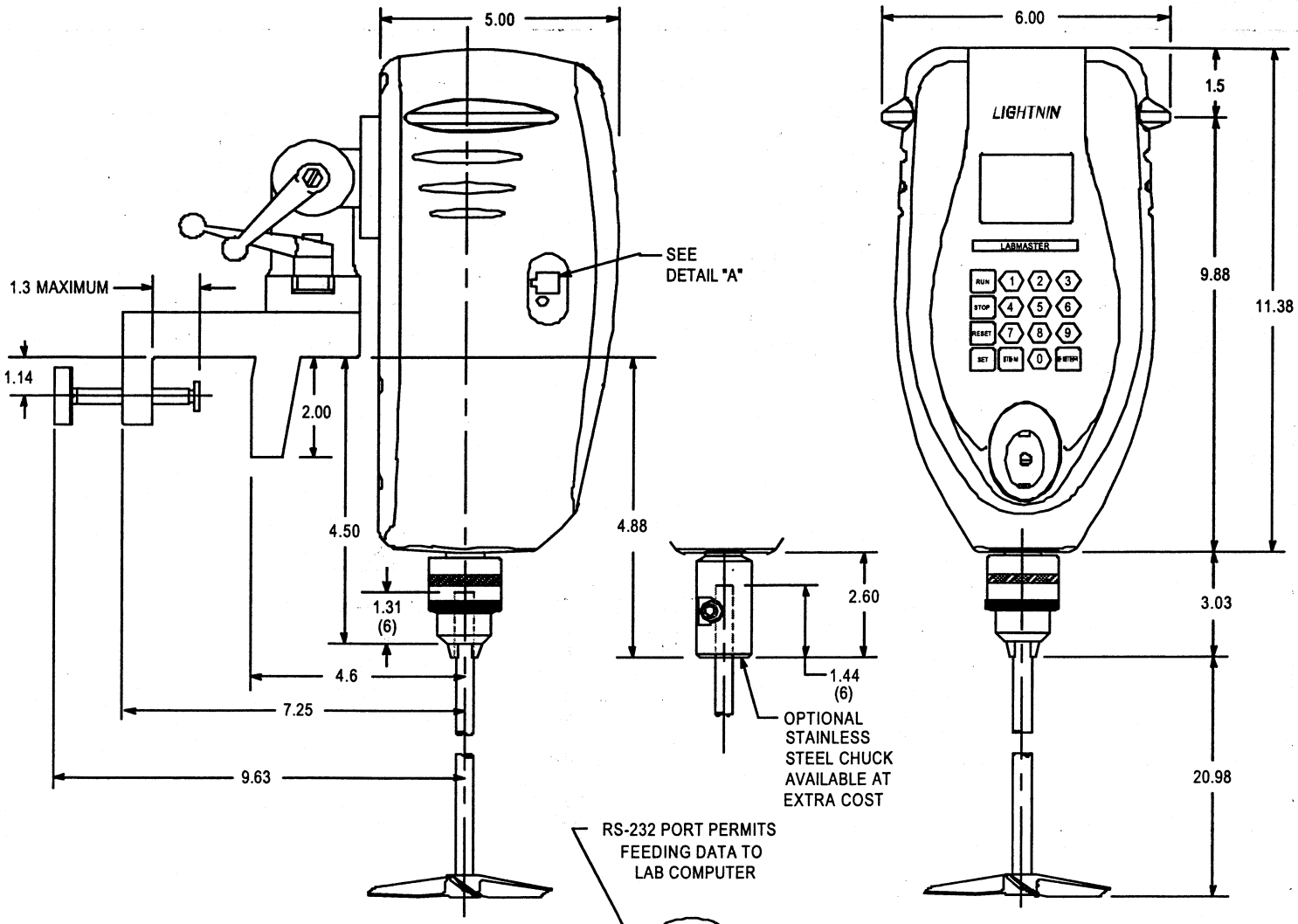
L1U10 & L5U10

VARIABLE SPEED

LABORATORY MIXER

DRAWING NO. DS-P-134D(BOOK)

Figure 1 - General Arrangement Drawing



LabMaster IMPELLERS INCLUDED				
MODEL	A310 DIA. (IN.)	A100 DIA. (IN.)	R100 DIA. (IN.)	A320 DIA. (IN.)
L1U10F	4.00	2.72	2.00	—
L5U10F	--	3.12	2.00	5.00

MODEL	H.P.	WATTS	SPEED REDUCTION	OUTPUT R.P.M.
L1U10F	1/8	90	1:1	50 - 1800
L5U10F	1/8	90	3.66:1	20 - 550

NOTES:
(1) VARIABLE SPEED RANGE: 50 - 1800 RPM
(2) TOTAL MIXER WEIGHT: 18 LBS. OPTIONAL RING STAND WEIGHT: 14 LBS.
(3) POWER CORD WITH GROUNDED PLUG. LENGTH APPROX. 6 FEET
(4) ALL DIMENSIONS ARE IN INCHES.
(5) THE SHAFT LENGTH OF THE L1U10F MODEL CAN BE ADJUSTED BY PASSING THE SHAFT THROUGH THE UNIT.
(6) MODEL L5U10F ONLY

CE COMPLIANT

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LIGHTNIN®
MIXERS AND AERATORS

DIMENSION DRAWING

LabMaster

L1U10F & L5U10F
VARIABLE SPEED LAB MIXER
WITH COMPUTER CONTROLLER

ISO 9001 CERTIFIED

CERTIFIED BY: DATE:

© LIGHTNIN 2001

DRAWING NO. DS-P-135C(BOOK)

Figure 2 - General Arrangement Drawing

2 *LIGHTNIN* LabMaster Mixer Installation and Operation

2.1. Mount the mixer on the LIGHTNIN ring stand (or tank rim). Insert the mixer shaft into the shaft chuck and tighten. If shaft run-out is excessive, re-chuck the shaft. Orient the shaft/impeller in the approximate location illustrated in the plan and elevation views.

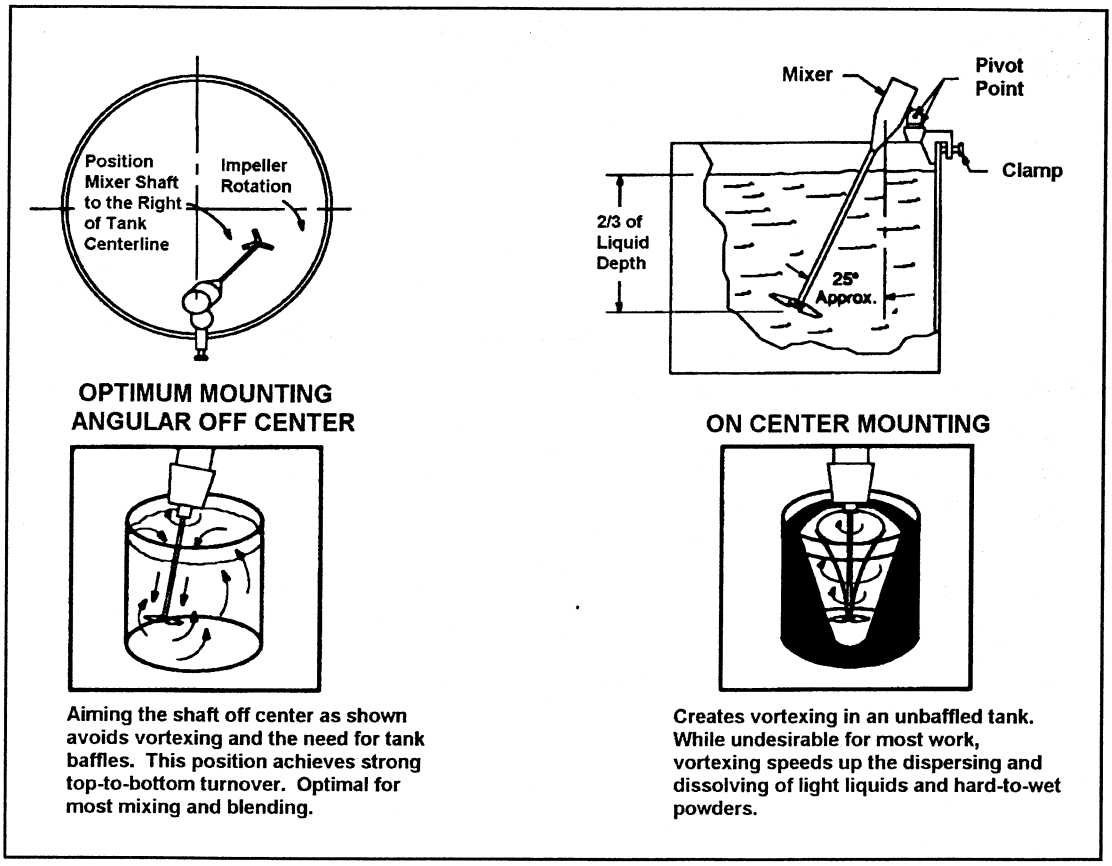


Figure 3 - Initial Installation

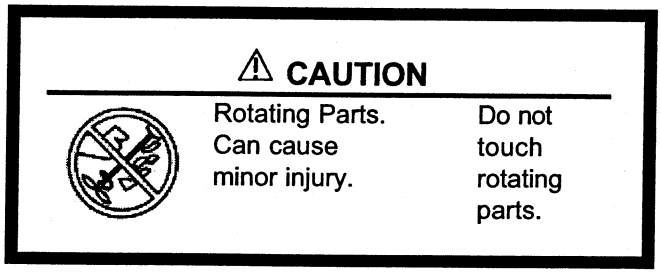
2.2. The LabMaster mixer is shipped configured for the specific destination with the appropriate line cord. Check whether the voltage indicated on the rear of the mixer matches the available mains voltage.

2.3. Connect the power cord's plug only to a grounded receptacle. Refer to mixer nameplate for power requirements and specifications.

Conforms to ULSTD 3101
Certified to CAN/CSA 1010
120612

LIGHTNIN LabMaster Mixers are listed to UL Standard 3101, Third Edition, "Laboratory Equipment" and certified to CAN/CSA 1010 — "Laboratory Equipment", IEC 1010, IEC 1010 with Japanese Deviations, FCC Part 15 — Subpart B — Class A, and EN 55022 — Class A and VCCI Level A.

2.4. Set the speed and start the mixer, adjusting the speed to achieve desired mixer action as outlined in **Section 5** and **Section 6**.



2.5. For models provided with additional styles and diameters of impellers when changes are made:

a. Install A310, A315, A320, and A100 impellers with the convex face of the blades facing up. Tighten set screw securely.

b. Install R100 impeller with the hub body portion of the impeller facing up. Tighten set screw securely.

c. A200 impeller can be oriented either way on shaft.

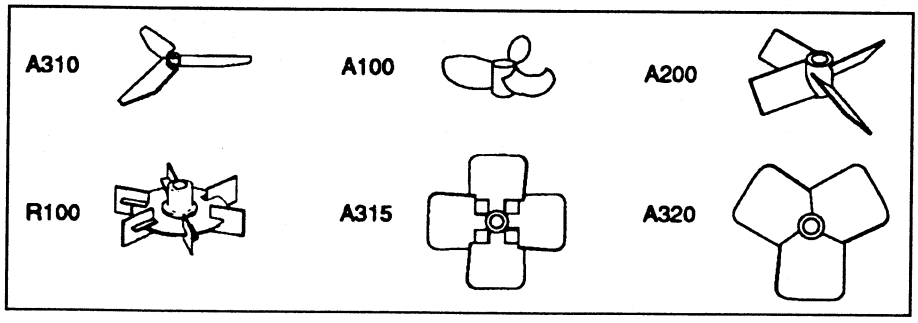


Figure 4 - Impellers

2.6. Each time a different impeller is installed, the mixer must be reconfigured to match the style and diameter of the impeller being used. See **Section 6** for instructions.

2.7. Impeller Adjustment: (DISCONNECT POWER CORD PRIOR TO ADJUSTING)

a. L1U10 and L1U10F models have the thru-shaft feature. Remove the blanking grommet from the top of the housing. Impellers can be adjusted by raising or lowering the shaft. Loosen the chuck with chuck key, adjust the shaft to suit depth or desired mixing action. Retighten the chuck with chuck key. Re-install the grommet if thru-shaft feature is not in use.

b. On L5U10 and L5U10F series mixers without the thru shaft feature, adjust the impeller to the desired position on the shaft and secure with set screw.

2.8. Do not allow the mixer housing to become immersed or subjected to excessive splash or spray. The unit should be cleaned using a cloth moistened with warm water only – do not use detergent or solvent based cleaners. Should it be necessary to clean the Liquid Crystal Display (LCD), switch off the mixer and use lens cleaning tissue which should be lightly moistened with lens cleaning fluid or warm water.

2.9. There are no internal user serviceable components in the mixer. Do not attempt to open or dismantle mixers or warranty will be voided. Consult your nearest *LIGHTNIN* representative for qualified technical service assistance.

2.10. Two anti-surge fuses protect the mixer. It is recommended that the fuses be replaced in pairs, if necessary. **Use only approved fuses.** To change the fuses:

Disconnect power to unit.

Located fuses above and below the AC power inlet

Using a flat screwdriver blade, insert into the slot on the fuse holder, exert a little downward pressure and rotate counter-clockwise and the fuse holder will reverse out of the housing.

Replace new fuses and re-install holder.

Approved fuses: UL/CSA **3.15A 250v Anti-surge BUSSMAN type S506**

IEC **2.5A 250v Anti-surge BUSSMAN type S506**

2.11. REPOSITIONING DURING THE MIXING CYCLE:

Sometimes more than one kind of mixing action is needed. For example, you may first need to dissolve light powders, so start with the mixer centered to create a vortex that quickly disperses them into the batch. Stop the mixer and disconnect the power cord. Then, to maintain a uniform suspension or to blend in other fluids, reposition the mixer to angular off-center.

3 ON/OFF Switch

The LabMaster is activated by depressing the ON/OFF button located on the front of the unit. When the LabMaster is ON, the LCD will be illuminated.

4 Keypad Definitions

Run	1	2	3
Stop	4	5	6
Reset	7	8	9
Set	Item	0	Enter

Table 1 LabMaster Keypad

5 RUN MODE

In RUN mode, the top window will always display the current running speed. The DIRECTION icon and the IMPELLER STYLE icon will also indicate the direction and the impeller style. The lower window will display the information selected by the ITEM key. Pressing the ITEM key will cycle through the following displays in the lower window.

VIEW	Description.
Power	PWR icon, WATTS icon illuminated. Output watts is displayed
Torque	TORQUE icon, N.CM or OZ.IN icon illuminated. Output torque is displayed
Flow	PUMPING CAP icon, GPM or L/MIN icon illuminated. Flow is displayed
Temperature	TEMP icon, °C or °F icon illuminated. External temperature is displayed
Timer	TIMER icon illuminated. Either remaining time on countdown timer or elapsed run-time displayed in MM:SS form

Table 2 Run Mode Display Options

Views can be 'scanned' by pressing the ENTER key while in RUN mode. Scanning will display each of the measured parameters in turn for 10 seconds each. This will continue until the user exits from scan mode. To exit SCAN mode, press ITEM or ENTER.

ITEM	Toggles to next VIEW
ENTER	Enter SCAN mode, exit SCAN mode
RUN	Start the motor, if it was stopped.
STOP	Stop motor and illuminate 'STOPPED' icon.
RESET	Reset any errors, or ignore.
SET	Enter SET Mode

Table 3 Run mode - Keypad definitions

5.1. Faults

The mixer has built in fault tolerance and reporting. Examine the mixer for the source of the fault and press RESET or re-start the mixer to eliminate the fault condition.

Severe Overload	If the overload is severe, the motor will stop, OVER will be illuminated, and an alarm will sound.
Shaft Jam	If the shaft is stopped, the motor will stop, OVER will be illuminated, and an alarm will sound.
Over Temperature	If the internal temperature exceeds the limit, the motor will stop, OVER TEMP will be illuminated, and an alarm will sound.

Table 4 Faults

6 SET MODE

In SET mode the top window will display the current running speed. The SET icon will also flash. Pressing the SET key will cycle through the following options. On entering a set item, the current value will be displayed in the lower window or the current selection will be flashing (direction, units, and impeller type). A flashing arrow in the lower windows indicates that the user should enter a value.

SET ITEM	Description.
Speed	SPEED icon flashes. Current set speed displayed in digits. Use 0-9 to enter new set speed.
Direction	DIRECTION icon (either clockwise or counter-clockwise) illuminated. Use ITEM to toggle between directions. (Note: this set item will be skipped if the motor is running.)
Units	MM or IN icon flashing. Use ITEM to toggle between units. Select MM for SI units (mm, L/min, n.cm, °C) or IN for English units (in, GPM, in.oz. or °F).
Timer	TIMER icon flashes. Use 0-9 to enter the value for countdown timer in MM:SS form. With the countdown timer set, the unit will run until the timer expires. When the timer reaches 00:00, the unit will stop. If entry is 00:00, the unit will run continuously.
Impeller Style	IMP icon flashes. Use ITEM for select the impeller type. Upon selecting an impeller, the diameter is set to the default value. If you do not wish to use the default diameter, enter diameter in AAAA for millimetres or BBB.B for inches and tenths of inches. (Note: If USER is selected the user will be prompted by an arrow to enter a flow constant and impeller diameter).

Table 5 Set Items

After input or selection, there are three options. ENTER accepts setting and returns to RUN mode, SET accepts setting and cycle to next set item, RESET does not change setting and returns to RUN mode.

ITEM	Toggles to next selection/icon (direction, units, or impeller icons)
ENTER	Accept entered or selected setting and return to RUN mode
RUN	Start the motor, if it was stopped.
STOP	Stop motor and illuminate 'STOPPED' icon.
RESET	Ignore inputs for the current set item and return to RUN mode
SET	Toggle to the next set item, accepting any data or selections made in the previous set item

Table 6 Set Mode - Keypad Definitions

7 DIAGNOSTIC MODE

Diagnostics are used to test the unit on start-up and to calibrate power and temperature measurement.

7.1. Power On Test

Every time the mixer is powered on, the POWER ON test is run. This checks the hardware. The LCD windows briefly display the model number, software version, line voltage and frequency. The POWER ON test displays errors in the top window. In the event of there being a problem, the mixer will report the following error:

EBAD	ROM check sum bad

Table 7 Power On Test Error

7.2. Entering Diagnostic mode

To enter diagnostic mode, power on the unit while depressing the <5> key. The unit will display the DIA G icon and ARG in the top window, and be in diagnostic mode, ready for input. To exit the diagnostic mode, press ⟨**9**⟩ then ⟨**ENTER**⟩.

7.3. Acceptance Test

The acceptance test tests most of the hardware and peripherals. It tests the LCD and controller, the keypad, the micro controller, and the motor controls. The test begins from diagnostic mode by pressing ⟨**2**⟩ then ⟨**ENTER**⟩.

The timer window displays ACCE. A long and short beep indicates the microprocessors and beeper are working. The local keypad test starts by pressing key 1 and 1 is displayed on the LCD. Then, press the keypad keys 2-9 and the LCD displays that number, then press key 0 and 10 is displayed. Then press RUN and display shows11, STOP and display shows12, RESET and display shows 13, SET and display shows 14, ITEM and display shows 15 and press ENTER to clear and start the LCD test.

The LCD test starts by ACCE clearing from the upper window. All icons and seven segment digits are displayed .

The beeper sounds once if all phases of the test pass. If a failure occurs, an error code will be displayed as follows:

1- Indicates initialisation fault.

2- Indicates keypad test failure.

3- Indicates LCD test failure.

To exit the diagnostic mode, press**<9>** then **<Enter>**.

7.4. Power Measurement Calibration

To ensure the most accurate results, you must calibrate the mixer with this simple program prior to any series of mixing experiments.

NOTE: Start this procedure with the mixer power on. The shaft and impeller must be removed and set the mixer to its minimum speed value, press enter and switch the mixer OFF.

In diagnostic mode, press ⟨**6**⟩ and then ⟨**ENTER**⟩. The mixer runs the power calibration program. It starts the mixer and runs the motor to maximum speed, incrementing by 5 % each time. At each speed, it calibrates the measurement. This procedure will take up to 3½ minutes to complete.

The calibration can be terminated at any time by pressing ⟨**RESET**⟩. To restart the calibration, press ⟨**6**⟩ then ⟨**ENTER**⟩.

Motor losses are temperature dependent. It is recommended that the calibration program be run prior to any series of mixing experiments. Frequent calibration ensures the most accurate results.

NOTE: If the calibration process fails, the mixer beeps repeatedly until ⟨**RESET**⟩ is pressed.

The program will exit to RUN mode.

7.5. Temperature: Calibration Of External Probe

NOTE: This sequence is performed with the mixer motor stopped.

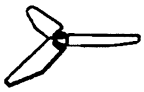
Enter diagnostic mode. In diagnostic mode, press ⟨**7**⟩ and then ⟨**ENTER**⟩. Place connected temperature probe in substance at known temperature and compare with temperature reading displayed on the LCD. To correct the mixer reading, press key 1 to increment reading upwards by one degree per actuation for degrees C and two degrees per actuation for degrees F. To decrease the LCD reading, press key 2.

To exit the diagnostic mode, press**<9>** then **<Enter>**.

8 ACCESSORIES

LIGHTNIN LabMaster Mixer								
Model	**Power Watts, HP**	**Thru Shaft**	**RS-232**	**Temp Probe**	**Output RPM**	**Torque NcM, Oz.in**	**Catalog #. (115VAC)**	**Catalog # (230VAC)**
L1U10F	90, 1/7	STD	STD	STD	50-1800	48, 68	836277PSP	836284PSP
L1U10	90, 1/7	STD	N/A	N/A	50-1800	48, 68	836275PSP	836282PSP
L5U10F	90, 1/7	N/A	STD	STD	20-550	159,225	836278PSP	836285PSP
L5U10	90, 1/7	N/A	N/A	N/A	20-550	159,225	836276PSP	836283PSP

IMPELLERS



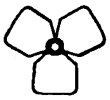
The A310 impeller is standard on LabMaster mixers. The high efficiency design develops 50% more mixing action than ordinary props. The A310 design also provides geometric similarity for accurate scale--up to larger *LIGHTNIN mixers*.

The A**311** Folding Impeller is perfect for mixing in vessels with small, narrow ports. It opens for full axial mixing action.

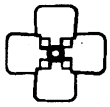
The R100 impeller provides high shear and moderate pumping action.

The A100 propeller provides moderate pumping action.

The R500 impeller creates a cutting, tearing action to disperse solids and shread fibrous materials.



The A320 impeller is efficient at blending high viscosity materials.



The A315 impeller is an excellent choice for gas dispersion with solids suspension.

Heavy-Duty Ring Stand

16 mm (.63″) Rod, 610 mm (24.0″)high
Heavy Base
Cat. #829453PSP

316 Stainless Steel Shafts

Model	**Shaft Dia.***	**Shaft Length**	**Catalog Number**
L1U10	9.5 mm (.38″)	610 mm (24.0″)	143727
L5U10	9.5 mm (.38″)	610 mm (24.0″)	143727

* 9.5 mm (.38″) dia. shaft turned down to 8 mm (.31″) dia. at impeller end

Impeller Ordering Information

Style	**Bore Dia.**	**Dia.**	**Catalog Number**
A310	8 mm (.31″)	64 mm (2.5″)	808955PSP
A310	8 mm (.31″)	64 mm (2.5″) ring guard	808999PSP
A310	8 mm (.31″)	86 mm (3.4″)	809410PSP
A310	8 mm (.31″)	96 mm (3.8″)	809411PSP
A310	8 mm (.31″)	114 mm (4.5″)	809412PSP
A100	8 mm (.31″)	25 mm (1.0″)	800570PSP
A100	8 mm (.31″)	38 mm (1.5″)	800569PSP
A100	8 mm (.31″)	51 mm (2.0″)	800568PSP
A100	8 mm (.31″)	51 mm (2.0″) folding	800578PSP
A100	8 mm (.31″)	51 mm (2.0″) ring guard	800580PSP
A100	8 mm (.31″)	69 mm (2.7″)	809417PSP
A100	8 mm (.31″)	79 mm (3.1″)	809418PSP
A200	8 mm (.31″)	51 mm (2.0″)	829448PSP
A315	8 mm (.31″)	76 mm (3.0″)	869468PSP
A315	8 mm (.31″)	102 mm (4.0″)	869470PSP
A315	8 mm (.31″)	127 mm (5.0″)	869472PSP
A320	8 mm (.31″)	76 mm (3.0″)	869513PSP
A320	8 mm (.31″)	102 mm (4.0″)	869515PSP
A320	8 mm (.31″)	127 mm (5.0″)	869381PSP
A410 'A'	8 mm (.31″)	100 mm (3.9″)	218837PSP
R500	8 mm (.31″)	51 mm (2.0″)	869579PSP
R500	8 mm (.31″)	76 mm (3.0″)	869580PSP
R100	8 mm (.31″)	38 mm (1.5″)	809414PSP
R100	8 mm (.31″)	51 mm (2.0″)	809415PSP
Paddle	8 mm (.31″)	51 mm (2.0″)	800579PSP

8.1 LABMASTER STAINLESS STEEL CHUCK RETROFIT AND SHAFT INSTALLATION INSTRUCTIONS

SECTION 1 - STAINLESS STEEL RETROFIT - MODELS L1U10, L1U10F, L5U10, L1U10F

WARNING: DISCONNECT MOTOR POWER CORD OR OTHERWISE LOCK-OUT POWER SUPPLY BEFORE SERVICING THIS MIXER. EYE PROTECTION MUST BE WORN.

1.1 Place a hex key or screw driver (Maximum diameter 0.175", Minimum length 4") into the small hole in the back of the LabMaster housing. The tool must pass through the holes in the mixer drive shaft and into a cup inside the case to prevent; bending the tool, possible damage to the inside of the mixer, and the drive shaft from turning.

1.2 Using a strap wrench or locking pliers, remove the steel chuck.

1.3 Apply Loctite 222MS to the drive shaft threads.

1.4 Thread the stainless steel chuck onto the drive shaft and tighten.

1.5 Remove the hex key or screw driver.

SECTION 2 - STAINLESS STEEL RETROFIT - MODELS L1U03, L1U08, L1U08F, L5U08, L5U08F

WARNING: DISCONNECT MOTOR POWER CORD OR OTHERWISE LOCK-OUT POWER SUPPLY BEFORE SERVICING THIS MIXER. EYE PROTECTION MUST BE WORN.

2.1 Restrain the mixer drive shaft.

2.2 Using a strap wrench or locking pliers, remove the steel chuck.

2.3 Apply Loctite 222MS to the drive shaft threads.

2.4 Thread the stainless steel chuck onto the drive shaft and tighten.

2.5 Remove the mixer drive shaft restraint.

SECTION 3 - SHAFT INSTALLATION

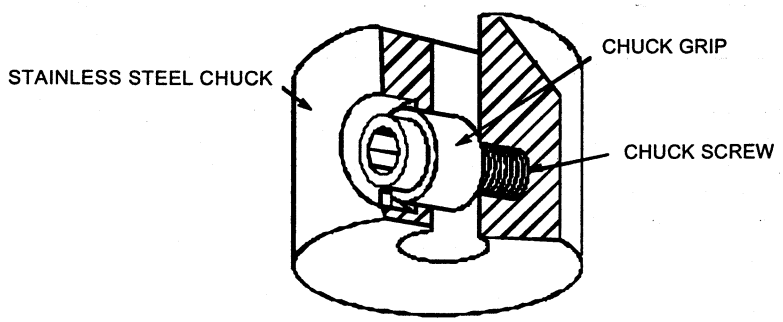
WARNING: DISCONNECT MOTOR POWER CORD OR OTHERWISE LOCK-OUT POWER SUPPLY BEFORE SERVICING THIS MIXER. EYE PROTECTION MUST BE WORN.

3.1 To install the mixer shaft, back off (DO NOT REMOVE) the chuck screw, see below.

Note: Chuck screw removal will cause the chuck grip to fall out.

3.2 Insert the mixer shaft into the chuck bore. Tighten the chuck screw. The chuck grip will press against the mixer shaft holding it in place. DO NOT IMPACT THE WRENCH OR USE AN EXTENSION

3.3 To remove the mixer shaft back off the chuck screw 1/4 turn. DO NOT REMOVE the chuck screw.



9 LabMaster FEATURES

- RS–232 port permits recording data and remote computer operation.
- Speed Display: 50–1800 rpm for direct drive; 20–550 for gear drive
- Process Watts and Torque Display
- Timer Display (counts up or down).
- Flow readout (L/min or GPM) for seven different impellers
- Standard Temperature Probe –Readouts in °F or °C.
- Thru-Shaft Design for infinitely variable impeller position.
- Calibration for process watts and temperature measurement.
- User-defined acceleration/deceleration rates with optional software package (default set by factory).
- Overload indicator and alarm
- Chemically Resistant Housing
- Universal Mounting Clamp (use with ring stand or tank rim).
- Tactile and audible feedback, sealed membrane control panel
- Fuse protection for severe overload
- Minor overload protection via automatic speed level control
- 90 Watts (1/7 hp), 115 or 230 volts, 50/60 Hz

SPECIFICATIONS

MODEL	L1U10(F) 115V	L1U10(F) 230V	L5U10(F) 115V	L5U10(F) 230V
INPUT VOLTAGE +/- 15%	115 VOLTS	230 VOLTS	115 VOLTS	230 VOLTS
INPUT CURRENT AMPS AC	2 AMPS	2 AMPS	2 AMPS	2 AMPS
INPUT FREQUENCY Hz +/-5%	50 / 60	50 / 60	50 / 60	50 / 60
SPEED RANGE RPM	50 TO 1800	50 TO 1800	20 TO 550	20 TO 550
SPEED REGULATION	+/- 5 RPM *PLUS (+)* +/- 0 .5% OF SET SPEED	+/- 5 RPM *PLUS (+)* +/- 0 .5% OF SET SPEED	+/- 5 RPM *PLUS (+)* +/- 0 .5% OF SET SPEED	+/- 5 RPM *PLUS (+)* +/- 0 .5% OF SET SPEED
TIMER ACCURACY	+/- 2% OF SET TIME	+/- 2% OF SET TIME	+/- 2% OF SET TIME	+/- 2% OF SET TIME
MAX TORQUE	68 IN-OZ	68 IN-OZ	225 IN-OZ	225 IN-OZ
POWER PEAK AT MAX RPM FOR 30 MINUTES	60 WATTS	60 WATTS	75 WATTS	75 WATTS
CONTINUOUS POWER AT MAX RPM	25 WATTS	25 WATTS	40 WATTS	40 WATTS
CURRENT AT RATED TORQUE +/- 15%	1.2 AMPS	1.2 AMPS	1.2 AMPS	1.2 AMPS
CURRENT LIMIT +/- 15%	1.4 AMPS	1.4 AMPS	1.4 AMPS	1.4 AMPS
CURRENT TRIP +/- 15%	1.7 AMPS	1.7 AMPS	1.7 AMPS	1.7 AMPS
FUSES 5 X 20 mm FAST ACTING 250V	3.15 A 250T3.15	2.5 A 250T2.5	3.15 A 250T3.15	2.5 A 250T2.5
INTERNAL TEMP TRIP POINT +/- 5% DEG. C	60 DEG. C	60 DEG. C	58 DEG. C	58 DEG. C
DERATING ABOVE 25 DEG. C	1. 5 WATTS PER DEG. C	1. 5 WATTS PER DEG. C	1. 5 WATTS PER DEG. C	1. 5 WATTS PER DEG. C

10 SALES OFFICES

LIGHTNIN **LabMaster**

PRECISION MIXING INSTRUMENTS

In addition to our LabMaster solid-state, microprocessor-controlled mixers, ***LIGHTNIN*** offers a complete line of fluid mixers for the laboratory and process industries.

LIGHTNIN can make lab work easier and more precise. Just call us.

Tell us what your lab needs to stir or mix, and we'll have your unit delivered.

In fact, call anytime you have a question about mixing. You'll get answers drawn from over 50 years of mixing experience for applications large and small. ***LIGHTNIN*** mixers are at work around the clock doing hundreds of thousands of specific jobs for labs and production processes around the world.

For immediate details on ***LIGHTNIN*** mixers or a demonstration, call ***LIGHTNIN*** or the ***LIGHTNIN***

Toll-free in the US 1-888 MIX BEST (1-888-649-2378)

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Australia
Homebush Bay +61 (2) 9763-4901

China
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Singapore
Jurong +65-6264-4366

11 WARRANTY

The *LIGHTNIN* mixer warranty: In the case of a failure of any mixer supplied, which is the result of defective material or workmanship, we will repair or replace it to your satisfaction, or refund the purchase price. This warranty extends to twelve (12) months after first installation of the mixer or for eighteen (18) months after its shipment from our factory, whichever period is shorter.

REPLACEMENT PARTS, INSTRUCTION MANUALS, ELECTRONIC AND MIXING APPLICATION TECHNICAL SUPPORT

SPX PROCESS EQUIPMENT
LIGHTNIN
P.O. Box 31370
Rochester, New York 14603
Tel. (585) 436-5550
Fax (585) 436-5589

LIGHTNIN sales engineers are located in principal cities around the world.

FOR AN UP TO DATE REPRESENTATIVE LIST

PLEASE GO TO: www.lightnin-mixers.com

-OR-

CALL: 1-888-649-2378

1-888-MIX-BEST

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LIGHTNIN

REPAIR & SERVICE GUIDE

LIGHTNIN Process Equipment Services (LPES): The fastest route to uptime.

Expertise: LPES technicians are the backbone of our dedicated service organization. They're uniquely qualified to keep your LIGHTNIN mixers running right.

Lightnin Certified Technicians: All LPES technicians are certified via training courses to ensure that the work they do meets the highest standards for consistency and reliability.

Genuine LIGHTNIN Parts: All LPES repairs follow original design specs and use only factory-authorized replacement parts.

Full LIGHTNIN Factory Warranty: We're so confident we'll do the job right that all LPES repair and service work is covered by a full factory warranty. What we repair, we guarantee – 100%.

Repair Services: *LIGHTNIN provides quick, reliable repair services – using only certified technicians and factory-authorized replacement parts – on gearboxes, mechanical seals (seal cartridge and seal assembly), steady bearings, machine assemblies, impellers, shafts and all portable units. This service can be provided either at your site or at a LIGHTNIN Service Center location. All work is backed by LIGHTNIN's full warranty on all parts and service.*

Exchange Services: *By eliminating repair time, LIGHTNIN Exchange Services offer the fastest way to get up and running when a breakdown occurs. LPES keeps selected speed reducers, portable units and mixer subassemblies in stock – and available for immediate exchange – at regional service centers. Simply call and we will configure the appropriate assembly and ship it to you within 24 hours. Then send the damaged assembly back to us within 30 days – to ensure you receive a discounted price.*

Equipment Upgrade Services: *Preventive maintenance is your best defense against costly unplanned downtime and repairs associated with old or obsolete equipment. The full range of LPES upgrade services give you a convenient and cost-efficient way to address problems before they happen by converting older equipment to the latest, most reliable LIGHTNIN designs.*

Additional LPES Services: *In addition to minimizing downtime and repair costs when equipment failure occurs, LPES offers a comprehensive range of services for maximizing productivity through every stage of the equipment life cycle.*

- **Installation and Start-up**
- **Maintenance and Repair**
- **Asset Management**

LIGHTNIN Process Equipment Services Warranty

When repairs to your LIGHTNIN mixer are needed, we guarantee the results for one full year. This exclusive warranty covers all parts and labor. Talk to your LIGHTNIN sales representative for more information.

Call:

The LIGHTNIN Experts

When your need is urgent and after normal business hours call our 24-hour response team hotline at 1-888-MIX-BEST (U.S. and Canada). Your request will be promptly processed and directed to your nearest LPES team member. For more information visit our website at: www.lightninmixers.com.

Factory Service Center Locations

Chicago, Illinois
Houston, Texas
Mulberry, Florida
Reading, Pennsylvania
Rochester, New York
San Francisco, California
Wytheville, Virginia

Authorized Service Center Locations

Baton Rouge, Louisiana
Concord, Ontario, Canada
East Hanover, New Jersey
Macon, Pooler, Roswell, Georgia